

PROPOSED REFORM OF THE CALENDAR.

IN the issue of NATURE for April 27 a concise account was given of the various proposals which have recently been put forward for the reform of the calendar. There is no reason to think that the subject has gained any serious general attention in England, if the fixing of Easter and the dependent festivals be regarded as a distinct question. But it has received a certain recognition in the discussions of some public bodies of an international character, such as the Congress of Chambers of Commerce; and the Swiss Government has invited a conference for its formal consideration. In order to bring a definite scheme before the public a Calendar Reform Bill was presented to Parliament by Mr. Robert Pearce. The main features of the Bill were briefly described in the article quoted. The first day of the year is called New Year Day, and is placed outside the reckoning of the week and the month. In leap years a day called Leap Day is intercalated between the end of June and the beginning of July, and is equally excluded from the week and the month. By this device there are left 364 days in every year, which are divided into four equal quarters of 91 days. Each quarter is subdivided into three months containing respectively 30, 30, and 31 days. Since 364 is exactly divisible by seven, the first of January always falls on the same day of the week, and the result of making this day Monday is to give 26 weekdays in every month, the four longer months containing five Sundays. Every calendar date corresponds to a particular day of the week (*e.g.* Christmas Day always falls on a Monday) and the calendar is fixed, no longer changing as at present from year to year.

No doubt such a system possesses slight advantages from the point of view of simplicity over our present calendar. Apart from the objections which must be urged against any disturbance of conventions to which we have grown accustomed on anything less than adequate grounds, the great disadvantage attaches to the scheme that it interrupts the continuity of the weeks. The practical effect of this is seen where two or more calendars are in use side by side. Thus inconvenience must arise even now from the Jewish Sabbath falling on our Saturday. Under the provisions of the Calendar Reform Bill the case would be worse, for it would no longer hold a fixed place in the Christian week.

A second Bill has now been presented to Parliament, this time by Sir Henry Dalziel. While differing from Mr. Pearce's Bill, the new proposals contain nothing of importance which will be novel to readers of our previous article. For the Bill merely embodies the suggestions made by Mr. John C. Robertson at the fourth International Congress of Chambers of Commerce held in London in June, 1910. The differences arise in the treatment of the four quarters of 91 days. These are divided into three months containing respectively 28, 28, and 35 days. Thus each month contains an exact number of weeks, and is made to begin with a Sunday. Incidentally it is necessary to move Easter Sunday from April 14, as before proposed, to April 15. Also Christmas Day will fall automatically on a Wednesday instead of on a Monday. The advantage of the whole scheme is to obtain commensurability between the month and the week, but it is an advantage dearly bought at the sacrifice of even approximate equality between the months. This necessitates special legal provision for payments in the case of monthly contracts to be made proportional to the length of the month concerned. Moreover, it requires legal definition for the duration of a "month" from any given date. Thus we understand that a month beginning on any day of the last week

of a long month (containing 35 days) will close on the last day of the following month. At least, this is the interpretation which, after careful thought, we have placed upon the following interesting example of Parliamentary draughtsmanship:—

"8. In calculating monthly periods the following rule shall apply:—In any period beginning in a long month and ending in a short month, the last day of the short month shall be held to be the corresponding day to any of the days in the last week of the long month."

If this interpretation be correct, a month may mean any period from 28 to 35 days in length. Surely the clause comes perilously near to a *reductio ad absurdum* to the whole scheme. We can imagine the following simple problem:—"A domestic servant is engaged on March 32 at 22*l.* a year. What is the amount of the first monthly payment, and when will it fall due?" We are utterly at a loss to solve the question, and suggest it for the consideration of the framers of the Fixed Calendar Bill.

The fundamental feature common to both the Bills alluded to is the use of the *dies non*. Mr. Alexander Phillip, who was responsible for reviving the idea of this fiction and advocating its practical convenience, appears to have become impressed with the extent of the opposition likely to be encountered before it can be adopted. Accordingly, in a paper before the section of Economic Science and Statistics, read at the recent meeting of the British Association, and in a pamphlet with which we have been favoured, he seems to have abandoned those who are seeking to give legislative form to his ideas, and to advance a totally different suggestion. This requires that February shall gain two days, that July and October shall each lose one day, and that the extra day in leap-year shall be placed at the end of June. Then in each quarter (now containing three calendar months) a period of twelve weeks (always beginning on a Sunday) can be found, two such successive periods being separated by a week. The idea is that public engagements can be more conveniently fixed by reference to the proposed twelve-week period, while the correspondence between this reckoning and the ordinary calendar can be very simply exhibited by a "perpetual adjustable" arrangement. But this practically means that we should have two calendars side by side, and no further criticism seems to be necessary.

It is fairly evident that the group of people who are bent on introducing a change in our present calendar are not agreed as to the precise form which that change should take. In the meantime it is probable that public opinion in this country is not ripe for any reform. It would welcome a fixed Easter, but it is more than likely that any radical alteration of the calendar would be resented. Since the reformers adhere to the yearly divisions of the Gregorian system, no scientific question is involved at any point, and the public convenience and public feeling are alone concerned with the issue. H. C. P.

NOTES.

A SOMEWHAT tardy recognition of the service rendered by Amedeo Avogadro to systematic chemistry was made by the unveiling at Turin of a bronze monument to his memory on September 24, erected, as the result of an international subscription, under the auspices of the Royal Academy of Sciences of Turin. The King of Italy presided at the inauguration ceremony, which was attended by nearly all the more eminent Italian chemists and physicists, as well as by a number of representatives of foreign academies, including M. Haller, of the Paris Academy of

Sciences; M. Moureu, of the Chemical Society of France; Prof. Nernst, of the Chemical Society of Berlin; and M. Guye, of the Geneva Society. No representative of the Royal Society or of the Chemical Society was, unfortunately, able to be present. The date selected was the centenary of the publication of Avogadro's celebrated memoir.

SIR WILLIAM E. SMITH, C.B., Superintendent of Construction Accounts and Contract Work, has been appointed to succeed Sir Philip Watts, K.C.B., F.R.S., as Director of Naval Construction. Sir William E. Smith was born in 1850, and joined the Portsmouth Dockyard in 1861, when only eleven years of age. In 1865 he was apprenticed as a shipwright at Woolwich. In 1866 he was transferred to Portsmouth Dockyard, and, having spent four years' apprenticeship, joined the South Kensington School of Naval Architecture. He entered the Royal Corps of Naval Constructors in 1873, and succeeded Sir William White as an instructor of naval architects at the Royal College at Greenwich in the early eighties. Sir William E. Smith is the Admiralty representative on the Committee of Shipbuilding Materials, in connection with engineering standards. He represents the Institution of Naval Architects, of which he is a vice-president, on the executive council of the National Physical Laboratory.

At the annual statutory meeting of the Royal Society of Edinburgh, held on October 23, the following office-bearers were elected:—*President*, Sir William Turner, K.C.B., F.R.S.; *vice-presidents*, Prof. J. C. Ewart, F.R.S., Dr. J. Horne, F.R.S., Dr. J. Burgess, Prof. T. Hudson Beare, Prof. F. O. Bower, F.R.S., Sir Thomas R. Fraser, F.R.S.; *general secretary*, Prof. George Chrystal; *secretaries to ordinary meetings*, Dr. C. G. Knott, Dr. R. Kidston, F.R.S.; *treasurer*, Mr. J. Currie; *curator of library and museum*, Dr. J. S. Black; *councillors*, Prof. D. Noël Paton, Dr. W. S. Bruce, Prof. F. G. Baily, Dr. J. G. Bartholomew, Dr. R. H. Traquair, F.R.S., Prof. J. Walker, F.R.S., Prof. A. Robinson, Sir W. S. McCormick, Prof. Crum Brown, F.R.S., Prof. T. H. Bryce, Dr. Benjamin N. Peach, F.R.S., and Mr. W. A. Carter.

For several years past Dr. W. N. Shaw has organised for the months October to March a series of meetings at his office for the informal discussion of important contributions to meteorological literature, especially those by colonial or foreign meteorologists. When these meetings took place at the old Meteorological Office in Victoria Street their success was so great that the room available was scarcely sufficient to accommodate those who attended them. In the new quarters at South Kensington the space is nearly all that could be desired, and Dr. Shaw welcomes not only those who contribute observations to the office, but others interested in meteorology. The meetings take place on Mondays every fortnight, and the first of the series commenced last Monday. In the circular which announces the dates of the meetings a list of the suggested subjects for discussion is given, and these show the wide range which the discussions cover. The writer of this note has attended most of the meetings already held, and with others he knows that they serve a very useful purpose. The bringing together of those interested in meteorology and the friendly interchange of views is a sure way of accelerating the advance of the subject in question.

At the conclusion of the Harveian Oration, delivered by Dr. Theodore Williams at the Royal College of Physicians on October 18, the president of the college, Sir Thomas Barlow, presented the Baly and the Bisset Hawkins gold

medals. The Baly medal was awarded to Prof. W. D. Halliburton, F.R.S. This medal was instituted in 1866 "in memoriam Gulielmi Baly, M.D.," and is awarded every alternate year to the person who is deemed to have most distinguished himself in the science of physiology, especially during the two years immediately preceding the award, and is not restricted to British subjects. The Bisset Hawkins medal was given to Dr. Clement Dukes. This medal was established in 1896 by Captain E. Wilmot Williams, at the suggestion of Dr. Theodore Williams, to perpetuate the memory of Dr. Bisset Hawkins. It is bestowed triennially on some duly qualified medical practitioner who is a British subject, and has during the preceding ten years done work deserving special recognition in advancing sanitary science or in promoting public health.

A REUTER message from Stockholm states that the Nobel prize for medicine has been awarded this year to Prof. Allvar Gullstrand, of the Upsala University, for his research work in connection with the dioptrics of the eye.

THE fourth Norman Kerr lecture in connection with the Society for the Study of Inebriety will be delivered by Prof. G. Sims Woodhead on Tuesday, November 14, in the lecture theatre of the Pathological Department, Medical Schools, Cambridge, upon "The Action of Alcohol on Body Temperature and on the Heart."

At a recent meeting of the executive committee of the British Science Guild, a committee was appointed to consider the question of holding lectures and the reading of papers. Other matters considered were the reduction of postage on scientific literature, coordination of charitable effort, and pollution of rivers. In connection with the committee on the conservation of natural sources of energy, it was decided to print the report at the end of the year.

THE members of the International Commission on Zoological Nomenclature have unanimously invited Prof. K. Kraepelin, Direktor des Naturhistorischen Museums, Steinthorwall Hamburg, Germany, to serve on the commission until the next International Congress, in the place of Prof. Maehrenthal, deceased; also Dr. P. Chalmers Mitchell, F.R.S., secretary of the Zoological Society of London, in the place of Dr. G. A. Boulenger, F.R.S., resigned.

A COURSE of twelve Swiney lectures on geology, dealing with "The Natural History of Rocks," will be delivered by Dr. T. J. Jehu in the lecture theatre of the Victoria and Albert Museum, South Kensington, during November, on Mondays, Tuesdays, and Saturdays, beginning Saturday, November 4. Admission to the lectures is free.

As the result of a personal visit to Kew, the Rev. Hilderic Friend has been able to report to the director the discovery of a considerable number of new annelids in the Royal Gardens. These include, among others, *Achaeta bohémica*, Vejd., *Dero obtusa*, D'Udek., and others new to Kew; *Paranais naidina*, Bret., and others new to Britain; and *Limnodrilus aurantiacus*, Friend, *Enchytraeus exiguus*, Fr., and *Fridericia pulchra*, Fr., new to science. The descriptions of new species will appear in *The Naturalist* and elsewhere.

FROM Prof. A. G. Nathorst, of Stockholm, we learn that Prof. Paul Richter, of Quedlinburg, Germany, died on October 9, at fifty-seven years of age. Prof. Richter was well known among palaeobotanists and geologists by his studies of the Cretaceous flora of Quedlinburg, of which he brought together extensive collections. He was the

author of the following papers, among others:—"Die Gattung *Credneria* und einige seltene Pflanzenreste" (1905), "Die Gattung *Hausmannia* Dunker" (1906), "Die Gattung *Nathorstiana* P. Richter und *Cylindrites* spongioides Goeppert" (1909), all of which are richly illustrated.

THE death is announced, at seventy-eight years of age, of M. Louis Grandeau, the distinguished French agricultural chemist, and author of the "*Traité d'analyse des matières agricoles*," perhaps the best known book of its time on agricultural analysis. M. Grandeau was one of the last surviving disciples of Boussingault, and maintained throughout the breadth of view and the lucid style of exposition that had characterised the master. He played a great part in the development of scientific agriculture in France, and held various high offices, such as the directorship of the Station agronomique de l'Est, a professorship at the Conservatoire nationale des Arts et Métiers, and was Inspecteur général des Stations agronomiques. He carried out numerous field experiments at L'École Mathieu de Dombasles, Nancy, and later at the Parc-aux-Princes, near Paris, and elsewhere, dealing with the effect of fertilisers on soils and on crops. He also made numerous investigations on the feeding of horses, especially of draft horses, his attention being attracted to this subject by his connection with the laboratory of the Compagnie générale des Voitures, Paris. There was no academic aloofness about M. Grandeau, and he recognised that the final test of his results must be their actual value to the practical man. Accordingly, he used the Press freely to disseminate his ideas; he was chief editor of the *Journal d'agriculture pratique*, and agricultural editor of the *Temps*. His main work was with technical problems. Of his more purely scientific work, perhaps the best known dealt with the black humic material that he extracted from soil, and regarded as an important agent in the nutrition of plants, a view, however, that has since undergone considerable modification.

THE first part of the plant protection scheme of the Selborne Society was to enlist the sympathy of the education authorities throughout the country, and the society has met with a hearty response to its suggestion that the authorities should distribute special leaflets to schoolmasters and schoolmistresses, and put up a card of advice to children in their schools. Many thousands of leaflets and cards have been asked for, and as the Selborne Society has authorised its plant protection section to apply any funds which it may receive to the furtherance of its own work, the society is now making an appeal to all those who desire to preserve the British flora to send subscriptions to the secretary at 42 Bloomsbury Square, London, W.C.

IN view of the reorganisation of the Aëronautical Society, a circular has been issued to members stating that persons desirous of joining the society as members under the old regulations (entrance fee 1*l.* 1*s.*, annual subscription 1*l.* 1*s.*) are still eligible if the application form is returned before November 1, 1911. A number of physicists, engineers, and others have already availed themselves of this privilege, including the Marquis of Tullibardine, the Hon. Maurice Egerton, Mr. Lionel de Rothschild, Profs. Archibald Barr, C. V. Boys, and H. F. Lunn, Captains A. H. Grubb and E. L. Gerrard, Lieuts. R. Gregory and C. R. Samson, Sir Charles D. Rose, Dr. W. Watson, and Messrs. Dugald Clerk, G. Holt Thomas, E. T. Willows, and Horace Short. In view of the uncertainty which probably exists as to the lines on which aëronautical problems may be developed in the future, it seems desirable

that persons interested in aërial navigation, either on general or other grounds, who may wish to be associated with the future developments of the society should lose no time in putting themselves in communication with the secretaries, 53 Victoria Street, Westminster.

TAKING as his text the fact that the British Museum has recently established a series of free daily demonstrations in the exhibition galleries to parties of visitors, Lord Sudely, in a letter to *The Times* of October 21, headed "The Utility of Museums," strongly advocates the immediate extension of this system to other museums and kindred institutions throughout the country. The demonstrations, or peripatetic lectures, at the British Museum are declared to be admirable, although the attendance on the part of the public is still comparatively small. This, however, it is urged, might be increased by judicious advertising. Weekly demonstrations at the Imperial Institute, and lectures in some of the American museums (for which, except in the case of schools, small fees are charged), are declared to have attained a success far ahead of what was originally expected. Among London institutions, Lord Sudely specially selects the Victoria and Albert Museum and the Natural History Museum as being admirably suited for demonstrations of this nature, which should also be adopted at Kew. Should the officials at these establishments find it impossible to undertake these demonstrations in addition to their present duties, it is recommended that the respective staffs should be strengthened for this purpose. If lectures of this type were once established at all museums, the writer of the letter is of opinion that the attendance of the public would be largely augmented, while the knowledge and culture of the nation generally would be stimulated. As regards the Natural History Museum, it may be pointed out that popular explanatory labels are conspicuously displayed in most of the exhibition; but it may at once be acknowledged that a much larger amount of information could be conveyed (and, if the right persons were found, in a more interesting manner) by means of popular demonstrations.

IT would be interesting to know the condition of large dew-ponds, such, for instance, as that at Chanctonbury Ring, on the South Downs, at the end of the unusually dry summer of this year. Colonel W. Pitt states in the *Journal of the Royal Society of Arts* for October 20 that, curious to learn how dew-ponds in general have fared, he wrote to inquire of the Royal Engineers, under whose charge is that part of Salisbury Plain which is War Department property. The report received states that "all dew-ponds in the Plain have gone absolutely dry this summer without exception." The officer who supplied this information adds that the ponds are generally, but not always, placed where they will take surface drainage, and consequently they received, no doubt, a certain amount of what little rainfall there has been.

MR. J. R. HENDERSON, the successor of Mr. E. Thurston as superintendent of the Government Museum, Madras, reports considerable additions to the collections during the year 1910-11. On the archæological side the most important are eight gold-plated sheets of copper with figures of Siva and other Hindu gods, dating from the early sixteenth century. A collection of Pandyan gold coins from the south Canara district is one of the most interesting numismatic finds made in recent years in southern India. A large collection of birds, insects, and Mollusca made in the Shevaroy Hills by the superintendent forms a valuable accession. The marine aquarium, stocked with local sea animals and fishes, continues to

flourish, the chief cause of mortality among the inmates being fights, in which victory is not always to the strong.

THE National University of La Plata has published in vol. xvii. of the *Revista del Museo de La Plata* a valuable monograph entitled "Los Tiempos Prehistóricos y Proto-históricos en la Provincia de Córdoba," prepared by Senhor Felix F. Outes, the secretary and director of the museum. This museum, founded by Dr. F. P. Moreno, has become, in its palæontological and anthropological departments, one of the most important in South America. It owes much to the collections of the late Dr. F. Ameghino, to which the present report is largely devoted. The writer reviews the collections from the earliest period, the most interesting series being the cave drawings and petroglyphs representing rude animal and other figures. The report—a scholarly production with full references to the literature of the subject—is an important contribution to our knowledge of the earlier civilisation of Argentina.

IN *Man* for October Prof. Flinders Petrie discusses a series of Roman portraits found at Hawara, on the eastern border of the Fayum, a site from which the most important existing specimens of this form of art have been obtained. The custom of decorating mummies with gilt stucco cases was much developed in Ptolemaic times. By the end of the first century A.D. it became the fashion to take the canvas portrait of the dead, which had hung in a frame on the house wall, and to place it over the face of the mummy as a substitute for a conventional stucco head. Wax was undoubtedly the medium for the colour, which was laid on either with a full brush or in a creamy state with short, sloping strokes. The personages depicted are of a mixed type, mainly European, but mingled in some cases with indigenous Egyptians, Syrians, and other Levantines attracted to the Fayum in the course of trade. Lastly, Roman jurisdiction had added an Italian upper stratum of officials, who had no objection to mixing with other local races; and we also find instances of a Spanish or Moresque-Spanish type in this curiously cosmopolitan population.

WITH the exception of one, by Dr. Annandale, on the batrachians and reptiles of Yun-nan, the papers in vol. vi., part iv., of Records of the Indian Museum are devoted to various groups of invertebrates, among which reference may be made to notes, by the same author, on fresh-water sponges from the Poona district of Bombay. One of these, *Corvospongilla burmanica bombayensis*, represents an Indian race of a species originally described from Burma.

THE appointment of Dr. F. A. Lucas to the directorship of the American Museum of Natural History has caused a vacancy in the office of chief curator of the Brooklyn Museum. According to the October issue of *The (Brooklyn) Museum News*, part of the work of excavating and laying the foundations of an extension of the Central Museum is in hand, while appropriations have been made for the erection of a new Children's Museum. A unique exhibit of animals and other organisms injurious to books and libraries was installed during the year. The insects include various larvæ passing under the general name of "book-worms," cockroaches, white ants, silver-fish, and the American spring-tail.

THE invertebrate marine fauna of the South Sandwich group (lying to the east of South Georgia) forms the subject of several short communications in series 3, vol. xiv., of the *Anales del Museo Nacional de Historia Natural de Buenos Aires*. In a general account of the history of the

islands, which bears no author's name, although in the table of contents it seems to be attributed—apparently incorrectly—to Mr. Chevreux, it is recalled that the Sandwich group, which was discovered by Cook in 1755, consists of twelve islands, or rocks, situated in 58° S. lat. Most of the specimens were collected by Dr. F. Lahille, of the La Plata Museum, but others were obtained by Captain Larsen. The majority of the isopod crustaceans were examined by Miss Harriet Richardson, who describes two new species of Serolis, but a new *Antarcturus* is named in the article which bears no author's name. The amphipods comprise a new *Ædiceroides* and *Eusirus*, described by Mr. E. Chevreux; but the pynogonids, which were submitted to Mr. E. Bouvier, all pertained to previously known forms.

IN view of the attention now concentrated on the brown rat in connection with the spread of bubonic plague, and the damage inflicted by this rodent on agricultural produce, Mr. Newton Miller, of Clark University, has undertaken an investigation of the rate of its propagation, the results of which are published in the October number of *The American Naturalist* (vol. xlv., p. 623). From this it appears that these rats, which have a gestation period of from 23½ to 25½ days, breed in every month of the year, and may produce five or six litters annually, the number of young ranging from six to nineteen, and averaging between ten and eleven. Although full growth is not attained before the eighteenth month, sexual maturity is reached in both sexes at least as early as the end of the fourth month. In one particular instance seven litters were produced in as many months by a single female; and in cases when all the young perish at birth, it is presumed that there would be a dozen litters in the course of a year. In captivity brown rats devour nearly 50 per cent. of their young at birth, most, if not all, of these being eaten by the females. Full details are given in the article with regard to the growth and development of the young.

THE current issue (Bd. 43, Heft 3) of the *Morphologisches Jahrbuch* contains a description, by Dr. H. Bluntschli, of an ovarian dermoid cyst in which teeth of two dentitions are recognisable; and studies by G. P. Frets on variations in the vertebral column of fruit bats and squirrels, and by Dr. Kriegbaum on the anatomy of the pharynx of certain mammals, birds, and reptiles.

IN the *Zeitschrift für wissenschaftliche Zoologie* (Bd. 98, Heft 3) J. Sokolow gives an account of the eyes of Pantopoda ("sea spiders"), which he considers to be more primitive in structure than those of arachnids. Drs. Löhner and Micoletzky describe two new acœlous turbellaria, namely, a new genus, *Monochœrus*, and a new species of *Convoluta* (*C. pelagica*). The latter is light green in colour, owing to the presence in the parenchyma of clumps of symbiotic plant cells (zoochlorellæ). This worm, which is very voracious, feeding on pelagic copepods, was taken in numbers off the west coast of Istria.

THE source of Chinese medical rhubarb is discussed by Dr. C. C. Hosseus in an article—received as a separate pamphlet—appearing in *Archiv der Pharmazie* (vol. ccxlix.). The strongest evidence is put forward in a statement received from Mr. E. H. Wilson that *Rheum officinale* furnishes the commodity supplied from Tachien-lu, while the best quality, taken from a variety of *R. palmatum*, is exported from the Suntang region.

As in the Malay Archipelago, so in Siam, the family of Dipterocarpaceæ is predominant in the forests; but whereas species in the former region are numerous, only

nine are recorded from Siam in the recent account provided by Mr. F. D. Ryan and Dr. A. F. G. Kerr in the *Journal of the Siam Society* (vol. viii., part i.). Of six species of *Dipterocarpus*, *D. tuberculatus* and *D. obtusifolius* are the most important, as they form in some localities almost pure, open jungle forests. *D. tuberculatus* is best developed on red clay; *D. obtusifolius* becomes dominant on sandy soil, while *Shorea siamensis* may also develop into forest on stony ground. Different forms, respectively tomentose and glabrous, were observed for several species; the tomentose form is associated with higher and drier situations. A peculiar feature is the storage of water by *D. obtusifolius*, so that if the stem be cut and turned upside down, a sufficiency is obtained to be serviceable to shooting parties.

OWING to the propensities of native growers and the traditions of the industry, the improvement and increase of cotton cultivation in India is a complicated problem; but, judging from the note compiled by Mr. B. Coventry, and published as Bulletin No. 26 of the Agricultural Research Institute, Pusa, appreciable success has already been attained with some measures, while others are proceeding favourably. The yield of Broach and other better-class native varieties has been improved by seed selection; coincidently stores have been established for distributing the pure improved seed. Promising results have been obtained by hybridisation at Surat and elsewhere. In Sind a good-class American cotton has been profitably raised, and Egyptian metafi is being tried where canal irrigation is feasible. A signal failure is noted in the case of experiments with tree cottons, which have therefore been discontinued.

THE September number of *The American Journal of Science* contains an account, by Mr. O. A. Derby, of a big diamond recently obtained from the Bagagem district of Minas Geraes, where the famous "star of the south" was found. That stone weighed 255 carats; and the same locality also yielded the "Dresden diamond," with a weight when uncut of $119\frac{1}{2}$ carats; the new stone, "estrella de Minas," weighs 175 carats. All three diamonds are elliptical in shape, with curved faces. It is mentioned in the same note that the largest diamond known from Brazil was one found in 1906, the weight of which was estimated at 600 carats. Its owner, being doubtful whether it was really a diamond, caused it to be struck with a heavy hammer on an anvil, in the belief that if genuine it would be uninjured! Fragments weighing about 100 carats were saved, from which one diamond weighing 8 carats was cut.

THE valuable meteorological charts published by the U.S. Weather Bureau for the large oceans and the great American lakes for November have been received. In addition to the usual statistical and other useful information contained on the face of the charts, the reverse sides of those of the North Atlantic and North Pacific contain articles on the sea surface and air temperatures, currents, &c. It is shown, *inter alia*, that high barometric pressure usually prevails over the central portion of the North Atlantic, the crest lying between longitudes 25° and 40° W., having slightly increased since October. Low barometric pressure obtains north of 55° , between longitudes 20° and 50° W., having decreased since October. The increased steepness of the barometric gradient causes frequent storms over the Transatlantic routes.

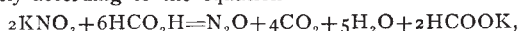
A SUMMARY of the weather issued by the Meteorological Office shows that the rainfall for last week was again

generally below the average, the only really appreciable excess being 0.48 inch in the south of Ireland. Contrary to recent experience, the duration of bright sunshine was below the average over the entire kingdom. The aggregate rainfall for the seven weeks of autumn as yet expired is below the average over the entire kingdom, except in the Channel Islands, where there is a slight excess, amounting to 0.09 inch. The deficiency in the west of Scotland is 3.59 inches, and in the north of Scotland 3.54 inches. The deficiency of rainfall since the commencement of the year is very great; in the north of Ireland it amounts to 8.76 inches, the west of Scotland 7.88 inches, the south-west of England 7.76 inches, and the Midland counties 7.70 inches. In the south-east of England the deficiency is 5.72 inches, where the excess of sunshine is 335 hours, which is the greatest excess in any part of the kingdom. The heavy rains of the present week will decrease somewhat the accumulated deficiency of rainfall.

ACCORDING to several communications which have been made to the *Physikalische Zeitschrift* recently, Drs. Elster and Geitel have succeeded in increasing the sensitiveness of the potassium photoelectric cell very materially by passing an electric discharge for a short time through the hydrogen in the tube. The potassium becomes covered with a greenish-blue film, which appears to give off negative electrons when illuminated much more readily than the metal itself. If the hydrogen remains in the tube the film disappears, and the sensitiveness of the cell falls. By replacing the hydrogen after the formation of the film by argon, the film becomes permanent and the sensitiveness constant. By covering the ordinary potassium cathode with a film of colloidal potassium a cell may be made sensitive to the infra-red rays. As an example of the use to which these sensitive cells may be put, the measurement of the decrease of the light from the moon during the eclipse of November 16, 1910, may be cited. With 232 volts on the cell full moonlight gave a current of 350×10^{-9} ampere, which sank to 220×10^{-9} as the moon entered the umbra, and to zero before totality was reached, owing to the passage of clouds.

THE Sociedad Matemática Española is to be congratulated on the success that is attending its efforts to remove a reproach from the annals of Spanish science. It was founded in April last, and has already published three numbers of its *Rivista*, a periodical which should play a notable part in the awakening and sustaining of mathematical interests throughout the peninsula. Each number opens with a biography and portrait, contains articles on pure and applied mathematics, reviews of current mathematical literature, articles on the history and methodology of the science, and a column for queries and answers. The society proposes to publish for the benefit of its members translations of foreign works on mathematics. This, when finances allow, is to be at less than cost price. On the same terms the society will supply to members translations of articles from foreign periodicals. A department has also been organised for the supply to members of references from the vast body of mathematical literature. The outlook is full of promise, especially when we remember that a much larger audience than Spain can at present produce awaits the appeal of the Sociedad in the intellectual centres south of the United States and north of the line joining Buenos Ayres and Valparaiso. The new society is a vigorous bantling. Time alone will show if it will rise to its opportunities. All information may be obtained from D. Jose Mingot, San Bernardo, 51, Madrid.

It is well known that the method of preparing nitrous oxide, which consists in heating ammonium nitrate, is not exempt from danger. A new and safer method of preparation, which gives a pure product, is described by A. Quarkaroli in the *Gazzetta Chimica Italiana* for September 19. It consists in heating 0.5 gram of nitre with 20-25 c.c. of formic acid, and collecting the gas which is evolved over a 20 per cent. solution of potash, which serves to absorb the carbon dioxide simultaneously formed. The heating must be done carefully, and it is best to apply a flame until the action just begins, and then remove it at once. When the action ceases another 0.5 gram of nitre is added to revive it, and this is continued until all the formic acid is used up. The action takes place quantitatively according to the equation



and this enables the decomposition to be applied to the estimation of nitrates. The action is carried out in a test-tube, and the gases collected over mercury in a graduated cylinder capable of taking 250 c.c.; the volume of mixed gases is first measured, and then the volume obtained after absorbing the carbon dioxide by introducing 2 c.c. of a concentrated solution of potash. The two measurements serve to control one another. The time occupied in an analysis by this method does not exceed five minutes, and as the results are practically as accurate as those obtained by the Schulze-Tiemann method, which takes an hour, the new method is to be preferred. In a second paper it is shown that the action involves initially the formation of nitrous anhydride, which then acts catalytically, and greatly accelerates the velocity of the change. By the addition of traces of substances such as chloric acid, hydrogen peroxide, or potassium permanganate, which destroy nitrous acid, the decomposition of the formic acid is greatly retarded; urea behaves in the same way, but is not quite so active.

A COPY has been received of the "Collective Index of the Institute of Brewing," which forms an exhaustive book of reference to scientific work carried out in connection with the fermentation industries in all parts of the world. The original Laboratory Club first issued Transactions in 1887, so that the index covers the period 1887-1910. It is divided into an authors' index of 130 pages and a subject index of 415 pages, figures which suffice to indicate the enormous amount of work which has been done in connection with fermentation. Besides the publication of original papers and the discussion on them, the institute has included for some years appropriate abstracts of scientific papers in its volumes, and great praise is due to the editor and his colleagues for the efficient way in which this work has been performed. As a consequence, it is possible to keep more easily in touch with the scientific literature of fermentation than is the case in any other industry, and the collective index will make the journal of the society indispensable to future workers in this field. The matter is printed exceptionally clearly across the page, a method which, in our opinion, is far preferable to the double columns adopted by many other societies.

A PAPER on the endurance of metals was read by Messrs. E. M. Eden, W. N. Rose, and F. L. Cunningham before the Institution of Mechanical Engineers on Friday, October 20. The experiments, which were carried out at University College, London, took the form of determining the number of alternations of stress which a loaded rotating beam could withstand before rupture. The most remarkable point shown in these tests is the absence of all speed effect between 250 and 1300 alternations per minute. In the experiments of Reynolds and Smith a very

large and perfectly definite speed effect was found for speeds between 1300 and 2000 alternations per minute. The entirely different results of the University College tests must be due to the different form of test and testing machine.

SOME interesting figures are quoted from the report on breakdowns of various generating plants by Mr. Michael Longridge, chief engineer of the British Engine, Boiler and Electrical Insurance Company, in the leading article in *Engineering* for October 20. Two similar gas engines, built by the same maker, and bearing consecutive numbers, were at work 100 miles apart, and broke their crank-shafts on the same day. The cause was bad design, the calculated stress being 21,000 lb. per square inch. Two cases of extraordinary endurance of cast iron are given, in both instances used for parts to which no one nowadays would venture to apply it. One of the cases was that of a cast-iron crank-shaft of an engine built in 1850. Between 1850 and 1873 the engine made 70,000,000 revolutions, and the stress on the neck at the beginning of the stroke was 3650 lb. per square inch; between 1873 and 1897 76,000,000 revolutions were made, the stress being 2270 lb. per square inch; between 1897 and 1910 41,000,000 revolutions were made with a stress of 2050 lb. per square inch. The other instance noted is that of a cast-iron gudgeon, which dated from before 1838. It has withstood, without fracture, at least 750 million applications of a stress equal to ± 1500 to 1700 lb. per square inch.

MESSRS. REYNOLDS AND BRANSON, LTD., of Leeds, have issued an abridged catalogue of chemical apparatus and chemicals containing additions and corrections to the eleventh edition of their catalogue of chemical and physical apparatus.

THE Emil Busch Optical Company, 35 Charles Street, Hatton Garden, London, E.C., has issued several well-illustrated pamphlets giving detailed particulars of the "bis-telar" objectives, of the Busch projection apparatus, and telephoto lenses.

PROF. BIRKELAND asks us to state that the times from U.S. Coast and Geodetic Survey stations given in his letter "On the Simultaneity of Certain Abruptly-beginning Magnetic Disturbances" in *NATURE* of October 12 (p. 483) should have been in decimals of a minute and not in minutes and seconds; the correct times are thus:—Honolulu, 10h. 20.7m.; Porto Rico, 20.8m.; Cheltenham, 21.9m.

OUR ASTRONOMICAL COLUMN.

MARS.—In No. 4530 of the *Astronomische Nachrichten*, where M. Jarry Desloges's note concerning the brightness of Libya on October 12 is now published, there is also a message from Señor Comas Sola saying that on October 11 he observed a brilliant cloud on the Libya area.

M. Jarry Desloges also continues his preliminary account of the observations made at Massegros during the present opposition, and directs attention to numerous changes of appearance since 1909. A number of important "canals" are seen in the L. Moeris region, the lake itself presenting a variegated appearance. M. Cimmerium and M. Sirenum, seen under good conditions, appear as mosaics, while the L. Solis, although in a very pale region, is relatively dark and is surrounded by a complicated system of "canals"; it is constricted in the middle, and the eastern half is ever the darker. The "canals" around this lake appear abnormal, being very broad, diffuse, and pale. The south polar cap is still seen, but is very small, although at times very brilliant, and the north polar cap presents very sharp fluctuations of relative visibility, extent, and tone. The bluish tone seen in 1909 is still there, but seems to be more brilliant where the edges are better defined.